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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/764,950	01/17/2001	Manfred Fuchs	P00,1909	6971

7590 07/18/2003

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EXAMINER

CLEVELAND, MICHAEL B

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 07/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application N . 09/764,950	Applicant(s) FUCHS ET AL.	
	Examiner Michael Cleveland	Art Unit 1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(f) he did not himself invent the subject matter sought to be patented.

2. Claims 1, 3-6, and 8-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Goodman et al. (U.S. Patent 5,427,817, hereafter '817). (Patel et al. (U.S. Patent 5,420,000, hereafter '000) is cited as evidence.)

'817 teaches vapor depositing a columnar (i.e., needle-shaped) fluorescent layer composed of fluorescent material, on a substrate (col. 3, lines 41-64; Figs. 2-5, 8); and

controlling the vapor deposition to produce cracks (i.e., voids) in the fluorescent layer that render it less dense than if there were no cracks and to produce optical separation between the needles (Figs. 2-5, 8).

'817 does not explicitly acknowledge that the fluorescent layer contains lattice imperfections. However, the phosphors of '817 are inorganic (col. 3, lines 30-40), and luminescence in inorganic solids originates at lattice imperfections. See '000, col. 4, lines 25-30. Therefore, the phosphors of '817 must have lattice imperfections.

Claims 3 and 13-14: The vacuum evaporation technique heats the substrate to vaporization temperature of 550-750 °C and produces a jet of vaporized phosphor material that deposits on the substrate (col. 3, lines 50-54). The substrate is cooled to 100 °C during deposition (col. 5, lines 7-10). Because the vaporized gas flows from a hot zone (the evaporation boat) to a cold zone (the substrate), it must inherently cool to some degree as it travels.

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Claims 4 and 10-12: Further, argon, an inert gas, is provided during the deposition process (col. 4, lines 41-54 and 61-67). There is no disclosure of means to heat or cool the argon gas, and therefore it must be provided at approximately room temperature. Thus, the cool argon gas in the chamber must inherently act to cool the evaporated phosphor gas to some degree as it travels to the substrate.

Claims 5-6: The argon may be present at 10 mTorr (1.3 Pa) (col. 4, lines 41-45).

Claim 8: Gases, including argon, are removed through the action of a vacuum pump (col. 3, lines 6-12).

Claim 9: Argon is introduced through control valve (52) (col. 3, lines 6-12).

Claim 15: The deposition rate of CsI is 1-10 microns/minute (col. 3, lines 45-48). CsI has a density of 4.51 g/cm^3 (from *Hawley's Condensed Chemical Dictionary*, 12th edn.). Thus, the deposition rate is about (1-10 microns/min.) (4.51 g/cm^3) ($1 \text{ cm}/10^4 \text{ microns}$) (1000 mg/g) = $0.451\text{-}4.51 \text{ mg/cm}^2 \text{ min}$.

3. Claims 1-15 are rejected under 35 U.S.C. 102(e) and 35 U.S.C. 102(f) as being clearly anticipated by U.S. Patent Application Publication US2001/0007352 which has common inventors with the instant application. See Figs. 1 and 7 and paragraphs [0016]-[0018].

This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the copending application was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

This rejection may not be overcome by the filing of a terminal disclaimer. See *In re Bartfeld*, 925 F.2d 1450, 17 USPQ2d 1885 (Fed. Cir. 1991).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goodman '817 in view of Tran et al. (U.S. Patent 5,368,882, hereafter '882).

'817 is discussed above. It does not explicitly state that the volume of the cracks is 5-50% of the phosphor film volume. Figs. 2 and 3 show small areas of crack volume while Figs. 4 and 5 show significant areas of void volume, but do not identify the amount. However, '882 demonstrates that it is possible to widen the cracks (i.e., increase the void volume by annealing). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have produced any desired crack volume, such as 5-50% with a reasonable expectation of success.

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goodman '817 in view of Noji et al. (U.S. Patent 4,528,210, hereafter '210).

'817 is discussed above. It discusses controlling the pressure of the argon (col. 4, line 41-col. 5, line 10), but does not explicitly teach that the pressure is controlled by passing the argon past a baffle, such as a partially closed valve. However, '210 teaches that the pressure of phosphor evaporation processes may be controlled by supplying argon through a partially closed valve (col. 5, line 42-col. 6, line 15). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the partially closed control valve of '210 as a means to provide the pressure control described by '817 with a reasonable expectation of success.

Response to Arguments

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8. Applicant's arguments filed 3/31/2003 have been fully considered but they are not persuasive.

The rejections under 35 USC 112, 2nd paragraph are withdrawn in view of Applicant's amendments and remarks.

Applicant argues that Goodman and '352 do not intentionally introduce lattice imperfections. The argument is unconvincing because inorganic solids exhibit luminescence because of lattice imperfection. See Patel '000, col. 4, lines 25-30, Fraas '361, col. 5, lines 13-29, and de Leeuw et al. '704, col. 1, lines 5-20.

Applicant argues that a partially closed valve does not divert a gas with a baffle. The argument is incorrect. Merriam-Webster's Collegiate Dictionary defines "baffle" as "a device (as a plate, wall, or screen) to deflect, check, or regulate flow (as of a fluid, light, or sound)". The partially closed valve of Noji is designed to regulate flow. Therefore, it is a baffle. Applicant argues that it does not deflect a gas. The partially closed valve necessarily deflects some of the air flow because a partially closed valve constricts the flow passage, and the constriction necessarily changes the flow pattern (i.e., diverts) at least some of the gas.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Patel et al. (U.S. Patent 5,420,000), Fraas et al. (U.S. Patent 3,976,361), and de Leeuw et al. (U.S. Patent 4,661,704) are cited for their teachings regarding lattice defects in phosphors.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Cleveland whose telephone number is (703) 308-2331. The examiner can normally be reached on 9-5:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 306-3186 for regular communications and (703) 306-3186 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



MBC
July 13, 2003



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